



General

Guideline Title

Occupational therapy practice guidelines for adults with traumatic brain injury.

Bibliographic Source(s)

Wheeler S, Acord-Vira A. Occupational therapy practice guidelines for adults with traumatic brain injury. Bethesda (MD): American Occupational Therapy Association, Inc. (AOTA); 2016. 47 p. [301 references]

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Golisz K. Occupational therapy practice guidelines for adults with traumatic brain injury. Bethesda (MD): American Occupational Therapy Association (AOTA); 2009. 258 p. [282 references]

This guideline meets NGC's 2013 (revised) inclusion criteria.

Recommendations

Major Recommendations

Note from the National Guideline Clearinghouse: In addition to the evidence-based recommendations below, the guideline includes extensive information on the evaluation process and intervention strategies for people with traumatic brain injury (TBI).

Definitions for the strength of recommendations (A–D, I) and levels of evidence (I–V) are provided at the end of the "Major Recommendations" field.

Recommendations for Occupational Therapy Interventions for Adults with TBI

Interventions to Improve Arousal and Alertness of People in a Coma or Persistent Vegetative State

- Multimodal sensory stimulation to improve arousal and enhance clinical outcomes (A)
- Auditory stimulation, especially when completed in a familiar voice, to increase arousal in the short term (B)
- Increased complexity, rather than intensity, of stimulation to increase intervention effectiveness (C)
- Median nerve stimulation to improve arousal and alertness (I)

Interventions to Improve Motor Function

- Exercise programs (aquatic, hand, and standard [e.g., balance]) to improve motor function (A)
- Computer-based interventions (e.g., virtual reality, gaming systems, 3-dimensional [3D] immersive games) to improve upper-extremity

- motor function and postural and dynamic balance (B)
- Rehabilitation programs to improve motor function (C)
- Multidisciplinary rehabilitation programs to improve motor function (C)
- Qigong to increase physical activity, strength, and balance (I)

Interventions to Improve Occupational Performance of People with Cognitive Impairments

- General memory interventions (involving restorative and/or compensatory approaches) to improve memory (A)
- Attention regulation interventions with or without goal problem-solving training to improve attention and executive functioning (A)
- Executive function strategy training such as goals management training and metacognitive strategy instruction to improve attention and executive functioning (A)
- Training in encoding techniques to improve recall (A)
- Training in use of cognitive assistive technology (except voice recorders and navigation devices) to improve memory (A)
- Various memory-specific compensatory approaches to improve memory (A)
- Use of compensatory interventions to improve multiple cognitive domains (B)
- Cognitive interventions to improve self-awareness (B)
- Computer-based interventions to enhance occupational performance (I)
- General restorative and/or compensatory approaches to improve attention and executive dysfunction (I)

Interventions to Improve Occupational Performance of People with Visual and Visual-Perceptual Impairments

- Scanning training to improve search skills when measured with digit search, computer tests, and a functional search task (A)
- Cognitive rehabilitation to improve performance in neuropsychological measures focused on visual perception (A)
- Scanning training accompanied by a visual and/or auditory stimulus to improve visual search skills and reading performance (B)
- Vision therapy to remediate oculomotor signs and symptoms (C)
- Cognitive compensatory strategies such as pacing, chunking, and self-talk to improve activity of daily living (ADL) performance (C)
- Fresnel 40-diopter prism to improve visual field awareness and functional mobility (C)
- Scrolling text to improve reading performance of people with reading difficulties as a result of hemianopsia (C)
- Cognitive strategies focused on social skills training to improve the ability to name basic emotions, interpret comments, and determine whether a person is lying or being sarcastic (I)
- Scanning as a standalone intervention to improve reading (I)

Interventions to Improve Occupational Performance of People with Psychosocial, Behavioral, or Emotional Impairments

- Cognitive-behavioral therapy (CBT) interventions to address psychosocial, behavioral, and emotional impairments and to improve occupational performance (A)
- Goal-directed outpatient rehabilitation to improve ratings of self-performance and satisfaction (A)
- Goal-directed outpatient rehabilitation to improve goal attainment, occupational performance, psychosocial reintegration, and adjustment levels (B)
- Aquatic exercise to improve tension, depression, anger, vigor, fatigue, and confusion (B)
- Functional skills training to improve social participation, community reintegration, independent living, emotional well-being, and quality of life (B)
- CBT modified to include mindfulness-based cognitive therapy (MBCT) to decrease depression and motivational interviewing to improve anxiety (C)
- CBT administered in the virtual context to address psychosocial and emotional distress, anxiety, and depression (C)
- Aerobic exercise to improve self-esteem, depression, quality of life, and community activity (C)
- Group and individual-based education interventions to improve psychosocial, behavioral, and emotional skills and impairments (C)
- Behavioral skills training to address behavioral functioning, anger, and community involvement (C)
- Social skills training interventions to improve occupational performance (C)
- Peer mentoring interventions to decrease avoidance coping, chaos in the home, alcohol abuse, and somatic symptoms of emotional distress and to improve health-related quality of life (C)
- Peer mentoring interventions to improve perception of community integration, levels of anxiety and depression, satisfaction with social integration, or social activity levels (I)
- CBT administered in the virtual context to address community integration and adaptive coping (I)

Activity and Occupation-Based Interventions to Improve Performance of Everyday Activities and Areas of Occupation and Social Participation

- Activity-based interventions focused on client-centered goals and delivered in a relevant environmental context to improve occupational performance (B)
- Multidisciplinary and interdisciplinary rehabilitation approaches to improve occupational performance and participation outcomes after moderate to severe TBI (B)
- Training in social behaviors and decoding emotions to improve partner-directed behaviors such as reciprocal conversation skills (B)
- Peer mentoring programs for people with moderate to severe TBI and their significant others to improve emotion-focused and avoidance coping and decrease chaos in the home environment, somatic symptoms, and alcohol abuse (B)
- Social peer mentoring program focused on accessing the community to increase social contact and improve perceived social support; note that such programs may also increase depressive symptoms (B)
- Virtual reality driving rehabilitation program to improve simulated driving performance in steering on open roads, turning, reacting to unexpected driving hazards, and adhering to traffic laws (B)
- Use of landmark-based directions, rather than cardinal or right-left directions, to maximize performance in following a walking route in the community (C)
- Social training programs to improve social participation (I)

Definitions

Levels of Evidence for Occupational Therapy Outcomes Research

Levels of Evidence	Definition
Level I	Systematic reviews, meta-analyses, and randomized, controlled trials
Level II	Two groups, nonrandomized studies (e.g., cohort, case control)
Level III	One group, nonrandomized (e.g., before-after, pretest and posttest)
Level IV	Descriptive studies that include analysis of outcomes (e.g., single-subject design, case series)
Level V	Case reports and expert opinions, which include narrative literature reviews and consensus statements

Note: Adapted from "Evidence-based medicine: What it is and what it isn't." D. L. Sackett, W. M. Rosenberg, J. A. Muir Gray, R. B. Haynes, & W. S. Richardson, 1996, *British Medical Journal*, 312, pp. 71-72. Copyright © 1996 by the British Medical Association. Adapted with permission.

Strength of Recommendation

- A–There is strong evidence that occupational therapy practitioners should routinely provide the intervention to eligible clients. Good evidence was found that the intervention improves important outcomes and concludes that benefits substantially outweigh harm.
- B–There is moderate evidence that occupational therapy practitioners should routinely provide the intervention to eligible clients. There is high certainty that the net benefit is moderate, or there is moderate certainty that the net benefit is moderate to substantial.
- C–There is weak evidence that the intervention can improve outcomes. It is recommended that the intervention be provided selectively on the basis of professional judgment and patient preferences. There is at least moderate certainty that the net benefit is small.
- I–There is insufficient evidence to determine whether or not occupational therapy practitioners should be routinely providing the intervention. Evidence that the intervention is effective is lacking, of poor quality, or conflicting and the balance of benefits and harm cannot be determined.
- D–It is recommended that occupational therapy practitioners do not provide the intervention to eligible clients. At least fair evidence was found that the intervention is ineffective or that harm outweighs benefits.

Note: Criteria for level of evidence and recommendations (A, B, C, I, D) are based on standard language from the U.S. Preventive Services Task Force (2012). Suggested recommendations are based on the available evidence and content experts' clinical expertise regarding the value of using it.

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

Traumatic brain injury (TBI)

Guideline Category

Counseling

Management

Rehabilitation

Treatment

Clinical Specialty

Family Practice

Neurology

Physical Medicine and Rehabilitation

Preventive Medicine

Psychiatry

Psychology

Intended Users

Advanced Practice Nurses

Nurses

Occupational Therapists

Physical Therapists

Physician Assistants

Physicians

Psychologists/Non-physician Behavioral Health Clinicians

Social Workers

Speech-Language Pathologists

Guideline Objective(s)

- To provide an overview of the occupational therapy process for individuals with traumatic brain injury (TBI) that is based on existing evidence of the effects of various occupational therapy interventions
- To help occupational therapists and occupational therapy assistants, as well as the individuals who manage, reimburse, or set policy regarding occupational therapy services, understand the contribution of occupational therapy in treating adults with TBI
- To help guide future decisions on areas for research by highlighting areas in which specific interventions lack evidence of a clear benefit or areas in which available interventions do not meet the specific needs of clients with TBI
- To serve as a reference for health care professionals, health care facility managers, education and health care regulators, third-party payers,

and managed care organizations, and those who conduct research to advance care of people with TBI

Target Population

Adults with traumatic brain injury (TBI)

Interventions and Practices Considered

1. Interventions to improve arousal and alertness of people in a coma or persistent vegetative state during the coma recovery phase
2. Interventions to improve motor function
3. Interventions to improve occupational performance of people with cognitive impairments
4. Interventions to improve occupational performance of people with visual and visual-perceptual impairments
5. Interventions to improve occupational performance of people with psychosocial behavioral, or emotional impairments
6. Activity and occupation-based interventions to improve performance of everyday activities and areas of occupation and social participation

Major Outcomes Considered

- Effectiveness of interventions
- Community integration/participation
- Daily life functioning
- Social and leisure participation
- Independence

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

The following six focused questions framed the review of occupational therapy interventions for people with traumatic brain injury (TBI):

1. What is the evidence for the effectiveness of sensory stimulation to improve arousal and alertness for people in a coma or persistent vegetative state after TBI?
2. What is the evidence for the effectiveness of interventions within the scope of occupational therapy practice to improve motor function for individuals with TBI?
3. What is the evidence that interventions to address cognitive impairments and skills improve occupational performance for people with TBI?
4. What is the evidence that interventions to address visual and visual-perceptual impairments and skills improve occupational performance for people with TBI?
5. What is the evidence that interventions to address psychosocial, behavioral, and/or emotional impairments and skills improve occupational performance for people with TBI?
6. What is the evidence for the effectiveness of occupation- and activity-based interventions to improve everyday activities and areas of occupation and social participation for people with TBI?

Search terms for the reviews were developed by the methodology consultant to the American Occupational Therapy Association, Inc. (AOTA) Evidence-Based Practice (EBP) Project and AOTA staff, in consultation with the review authors of each question, and by the advisory group. The

search terms were developed not only to capture pertinent articles but also to make sure that the terms relevant to the specific thesaurus of each database were included. Table G.1 in the original guideline document lists the search terms related to the population (people with TBI) and types of intervention included in each systematic review. A medical research librarian with experience in completing systematic review searches conducted all searches and confirmed and improved the search strategies.

Databases and sites searched included Medline, PsycINFO, CINAHL, and OTseeker. In addition, consolidated information sources, such as the Cochrane Database of Systematic Reviews, were included in the search. These databases are peer-reviewed summaries of journal articles and provide a system for clinicians and researchers to conduct systematic reviews of selected clinical questions and topics. Reference lists from articles included in the systematic reviews were examined for potential articles, and selected journals were hand searched to ensure that all appropriate articles were included.

Inclusion and exclusion criteria are critical to the systematic review process because they provide the structure for the quality, type, and years of publication of the literature that is incorporated into a review. Included articles were peer-reviewed scientific literature on participants with TBI published in English between 2008 and 2013 and within the scope of practice of occupational therapy. The review excluded data from presentations, conference proceedings, non-peer-reviewed research literature, dissertations, and theses. Studies included in the review provide Level I, II, and III evidence; Level IV and V evidence was included only when higher level evidence on a given topic was not found.

A total of 6,928 citations and abstracts were included in the reviews. For the question on coma, there were 1,130 references; for the motor question, 2,306 references; for the cognitive question, 694 references; for the vision question, 242 references; for the psychosocial and behavioral question, 1,512 references; and for the occupation question, 1,044 references. The consultant to the Evidence-Based Practice Project completed the first step of eliminating references on the basis of citation and abstract. The systematic reviews were carried out as academic partnerships in which academic faculty worked with graduate students to conduct the reviews. Review teams completed the next step of eliminating references based on citations and abstracts. The full-text versions of potential articles were retrieved, and the review teams determined final inclusion in the review on the basis of predetermined inclusion and exclusion criteria.

Number of Source Documents

A total of 132 articles were included in the final review describing 65 Level I, 29 Level II, 32 Level III, 3 Level IV, and 3 Level V studies.

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Levels of Evidence for Occupational Therapy Outcomes Research

Levels of Evidence	Definition
Level I	Systematic reviews, meta-analyses, and randomized, controlled trials
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Level V	Case reports and expert opinions, which include narrative literature reviews and consensus statements

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Methods Used to Analyze the Evidence

Review of Published Meta-Analyses

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

The teams working on each focused question reviewed the articles according to their quality (i.e., scientific rigor and lack of bias) and levels of evidence. Each article included in the review was then abstracted using an evidence table that provides a summary of the methods and findings of the article. American Occupational Therapy Association, Inc. (AOTA) staff and the Evidence- Based Practice Project (EBP) consultant reviewed the evidence tables to ensure quality control. All studies are summarized in full in the evidence tables in Appendix H of the original guideline document.

The limitations of the systematic reviews are based on the design and methods of the individual studies, including small sample sizes, short intervention periods, limited use of standardized testing, inclusion of diagnoses other than traumatic brain injury (TBI), and short follow-up periods. In addition, many of the studies in the review included concurrent interventions, so separating the effects of a single intervention may be difficult, and the role of occupational therapy is seldom discussed in multidisciplinary interventions.

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

A major focus of the American Occupational Therapy Association, Inc. (AOTA)'s Evidence-Based Practice (EBP) Project is an ongoing program of systematic review of multidisciplinary scientific literature, using focused questions and standardized procedures to identify practice-relevant evidence and discuss its implications for practice, education, and research. An evidence-based perspective is founded on the assumption that scientific evidence of the effectiveness of occupational therapy intervention can be judged to be more or less strong and valid according to a hierarchy of research designs, or an assessment of the quality of the research, or both. AOTA uses standards of evidence modeled on those developed in evidence-based medicine. This model standardizes and ranks the value of scientific evidence for biomedical practice using a grading system presented in the "Rating Scheme for the Strength of the Evidence" field. In this system, the highest level of evidence, *Level I*, includes systematic reviews of the literature, meta-analyses, and randomized controlled trials (RCTs). In RCTs, participants are randomly allocated to either an intervention or a control group, and the outcomes of both groups are compared. Other levels of evidence include *Level II* studies, in which assignment to a treatment or a control group is not randomized (cohort study); *Level III* studies, which do not have a control group; *Level IV* studies, which use a single-case experimental design, sometimes reported over several participants; and *Level V* studies, which are case reports and expert opinion that include narrative literature reviews and consensus statements.

The systematic reviews of research on people with traumatic brain injury (TBI) were supported by AOTA as part of the Evidence-Based Practice Project. AOTA is committed to supporting the role of occupational therapy in this important area of practice. The previous review on this topic was completed covering the time frame of 1986–2008. The current systematic reviews were updated for the period 2008–May 2013 because occupational therapy practitioners need access to the results of the latest and best available literature to support intervention within the scope of occupational therapy practice.

The six focused questions developed for the updated review were based on the search strategy of the previous review. Additional search terms were added to ensure comprehensive inclusion of the six questions. These questions were reviewed by review authors, an advisory group of content experts in the field, AOTA staff, and the consultant to the AOTA EBP Project.

Rating Scheme for the Strength of the Recommendations

Strength of Recommendation

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Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

Peer Review

Description of Method of Guideline Validation

This practice guideline was reviewed by a group of content experts in traumatic brain injury (TBI) that included a consumer representative.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

The final review included 132 articles. Studies included in the review provide Level I, II, and III evidence; Level IV and V evidence was included only when higher level evidence on a given topic was not found.

Number of Articles in Each Review at Each Level of Evidence

Review	Evidence Level					Total in Each Review
	I	II	III	IV	V	
Coma	4	0	4	1	0	9
Motor	6	3	2	2	3	16
Cognition	23	5	9	0	0	37
Vision	7	7	2	0	0	16
Psychosocial	15	8	12	0	0	35
Occupation and social participation	10	6	3	0	0	19
Total	65	29	32	3	3	132

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

This document may be used to assist:

- Occupational therapists and occupational therapy assistants in providing evidence-based interventions to adults with traumatic brain injury (TBI)
- Occupational therapists and occupational therapy assistants in communicating about their services to external audiences
- Other health care practitioners, case managers, clients, families and caregivers, and health care facility managers in determining whether referral for occupational therapy services is appropriate
- Third-party payers in determining the medical necessity for occupational therapy
- Legislators; third-party payers; federal, state, and local agencies; and administrators in understanding the professional education, training, and skills of occupational therapists and occupational therapy assistants
- Health and social services planning teams in determining the need for occupational therapy
- Program developers; administrators; legislators; federal, state, and local agencies; and third-party payers in understanding the scope of occupational therapy services
- Occupational therapy researchers in this practice area in determining outcome measures and defining current occupational therapy practice in order to compare the effectiveness of occupational therapy interventions
- Policy, education, and health care benefit analysts in understanding the appropriateness of occupational therapy services for adults with TBI
- Policymakers, legislators, and organizations in understanding the contribution occupational therapy can make in health promotion, program development, and health care reform to support adults with TBI
- Occupational therapy educators in designing appropriate curricula that incorporate the role of occupational therapy with adults with TBI

Potential Harms

The studies that met the inclusion criteria for the systematic reviews did not explicitly report potential adverse events associated with the interventions evaluated in these studies. Before implementing any new intervention with a client, it is always prudent for occupational therapy practitioners to be aware of the potential benefits and harms of the intervention. Clinical reasoning based on a sound evaluation of the client's strengths and limitations and an understanding of the intervention should be exercised to determine the potential benefits and harms of an intervention for an individual patient. Finally, clinical reasoning is also required to translate the intervention protocols used in the studies reviewed into client-centered, clinically feasible interventions.

Qualifying Statements

Qualifying Statements

- This guideline does not discuss all possible methods of care, and although it does recommend some specific methods of care, the occupational therapist makes the ultimate judgment regarding the appropriateness of a given intervention in light of a specific person's or group's circumstances and needs and the evidence available to support the intervention.
- This publication is designed to provide accurate and authoritative information in regard to the subject matter covered. It is sold or distributed with the understanding that the publisher is not engaged in rendering legal, accounting, or other professional service. If legal advice or other expert assistance is required, the services of a competent professional person should be sought.
- It is the objective of the American Occupational Therapy Association, Inc. (AOTA) to be a forum for free expression and interchange of ideas. The opinions expressed by the contributors to this work are their own and not necessarily those of AOTA.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Implementation Tools

Chart Documentation/Checklists/Forms

Resources

Staff Training/Competency Material

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Living with Illness

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

Wheeler S, Acord-Vira A. Occupational therapy practice guidelines for adults with traumatic brain injury. Bethesda (MD): American Occupational Therapy Association, Inc. (AOTA); 2016. 47 p. [301 references]

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2016

Guideline Developer(s)

American Occupational Therapy Association, Inc. - Professional Association

Source(s) of Funding

American Occupational Therapy Association, Inc.

Guideline Committee

Not stated

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Financial Disclosures/Conflicts of Interest

The authors of this practice guideline have signed a conflict-of-interest statement indicating that they have no conflicts that would bear on this work.

Guideline Status

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This guideline meets NGC's 2013 (revised) inclusion criteria.

Guideline Availability

Electronic copies: Not available at this time.

Print copies: Available for purchase from The American Occupational Therapy Association (AOTA), Inc., 4720 Montgomery Lane, Bethesda, MD 20814, Phone:1-877-404-AOTA (2682), TDD: 800-377-8555, Fax: 301-652-7711. This guideline can also be ordered online from the [AOTA Web site](#) .

Availability of Companion Documents

The following is available:

- Occupational therapy practice framework: domain and process. 3rd ed. Bethesda (MD): American Occupational Therapy Association, Inc. (AOTA); 2014. Available to order from the [American Occupational Therapy Association, Inc. \(AOTA\) Web site](#) .

In addition, the following are available in the original guideline document:

- Occupational therapy process for adults with traumatic brain injury (TBI)
- Case studies for occupational therapy practice with adults with TBI
- Selected International Classification of Diseases (ICD)-9 and ICD-10 codes
- Selected Current Procedural Terminology (CPT) ® codes for occupational therapy evaluations and interventions for adults with TBI
- Constraint-induced movement therapy and adjunctive interventions

Patient Resources

None available

NGC Status

This NGC summary was completed by ECRI Institute on October 27, 2010. This NGC summary was updated by ECRI Institute on October 20, 2016.

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